

NMDCAT

FULL LENGTH PAPER-3

HALF SYLLABUS - 1

Total MCQs: 200

Max. Marks: 200

BIOLOGY

- Q.1** *Mycoplasma* is:
 A) Eukaryotic and unicellular
 B) Eukaryotic and multicellular
 C) Prokaryotic and unicellular
 D) Prokaryotic and multicellular
- Q.2** In a typical eukaryotic cell, DNA molecules are found in:
 A) Nucleus, mitochondria, plastids
 B) Nucleus, mitochondria, Golgi apparatus
 C) Mitochondria, Golgi apparatus, plastids
 D) Nucleus, Golgi apparatus, plastids
- Q.3** Which of the following is rich in digestive enzymes?
 A) Mitochondria
 B) Chloroplast
 C) Lysosome
 D) Golgi bodies
- Q.4** All cells contain:
 A) Mitochondria and nucleus
 B) Golgi bodies
 C) Chloroplast
 D) Ribosomes
- Q.5** The function of glyoxysomes is:
 A) Protein metabolism
 B) Fat metabolism
 C) Carbohydrate metabolism
 D) Protein synthesis
- Q.6** Which of the following metabolic process occur in mitochondria?
 A) Histolysis of tissue
 B) Glycogenolysis
 C) Tricarboxylic acid cycle
 D) Glycolysis
- Q.7** Lysosomal enzymes are active at pH:
 A) 5
 B) 8
 C) 7
 D) Variable
- Q.8** Smooth endoplasmic reticulum is specialized for the synthesis of lipids and steroids. These organelles are found predominantly in:
 A) Pancreas
 B) Ovary
 C) Reticular cells
 D) Blood
- Q.9** Elementary particles are present in:
 A) Cisternae of Golgi apparatus
 B) Mitochondria
 C) Ribosomes
 D) Cisternae of ER
- Q.10** One of the most common enzyme found in peroxisome is:
 A) Hydrolases
 B) Dehydrogenase
 C) Catalase
 D) Reductase
- Q.11** The ring structure formed by glucose molecule is:
 A) 4 cornered
 B) 6 cornered
 C) 5 cornered
 D) 7 cornered
- Q.12** _____ is the most abundant carbohydrate in nature.
 A) Cellulose
 B) RuBP
 C) Glucose
 D) Starch
- Q.13** The type of polysaccharides which can be stored respectively in plants and animals are:
 A) Starch and Cellulose
 B) Starch and Glycogen
 C) Glycogen and Cellulose
 D) Glycogen and Starch
- Q.14** How many amino acids are used during the process of translation of an mRNA molecule?
 A) 18
 B) 20
 C) 21
 D) 22
- Q.15** The sequence and number of amino acid in protein is given by the:
 A) Secondary structure
 B) Primary structure
 C) Tertiary structure
 D) Quaternary structure

- Q.16 Cuticle is an example of:
 A) Acylglycerols
 B) Phospholipids
 C) Waxes
 D) Terpenoids
- Q.17 Chitin is present in all of the following structures except:
 A) Exoskeleton of arthropods
 B) Cell wall of fungus
 C) Setae of earthworm
 D) Cell wall of bacteria
- Q.18 All of the following are true about polysaccharides except:
 A) Sparingly soluble in water
 B) Can be hydrolyzed
 C) Less sweet in taste
 D) Can be branched
- Q.19 The chemical and physical properties of amino acids is based on:
 A) $-NH_2$ group
 B) $-R$ group
 C) $-COOH$ group
 D) All A, B, C
- Q.20 In a molecule of DNA, nucleotide of thymine pairs with:
 A) dUTP
 B) dAMP
 C) dCTP
 D) dGTP
- Q.21 Ionization of active sites and substrates are affected by:
 A) Slight change in temperature
 B) Slight change in pH
 C) Extreme change in temperature
 D) Extreme change in pH
- Q.22 Each enzyme shows its highest activity at particular temperature and pH called the _____ temperature and _____ pH.
 A) Optimum, Optimum
 B) Maximum, Maximum
 C) Minimum, Maximum
 D) Maximum, Minimum
- Q.23 The wavelength that is absorbed by photosynthetic pigments will:
 A) Transmitted
 B) Refracted
 C) Disappeared
 D) Reflected
- Q.24 The wavelength of visible light that is most absorbed by carotenoids is:
 A) Blue-violet
 B) Green-yellow
 C) Yellow-orange
 D) Red-orange
- Q.25 It acts as final electron acceptor during non-cyclic photophosphorylation:
 A) Primary electron acceptor
 B) H_2O
 C) $NADP^+$ reductase
 D) $NADP^+$
- Q.26 Which of the following is the product of cyclic photophosphorylation?
 A) $NADPH_2$ and ATP
 B) $NADPH_2$ and O_2
 C) $NADPH_2$, ATP and O_2
 D) ATP only
- Q.27 What does carbon fixation refer in Calvin cycle?
 A) Incorporation of CO_2 into Rubisco
 B) Synthesis of G3P from CO_2
 C) Incorporation of CO_2 in RuBP
 D) Synthesis of RuBP from CO_2
- Q.28 In electron transport chain, the electrons from NADH and $FADH_2$ are passed to:
 A) Cytochrome b
 B) Cytochrome a
 C) Cytochrome a_3
 D) Co-enzyme Q
- Q.29 The fate of pyruvic acid depends upon:
 A) Availability of O_2
 B) Energy status of the cell
 C) Presence of enzymes
 D) Presence of anti-metabolites
- Q.30 Which of the following enters in Krebs cycle?
 A) Pyruvic acid
 B) Acetyl co-A
 C) Citric acid
 D) G3P
- Q.31 Identify the correct sequence of taxonomic categories:
 A) Species-order-kingdom-phylum
 B) Species-family-genus-class
 C) Genus-species-order-phylum
 D) Species-genus-order-phylum
- Q.32 In five kingdom classification unicellular, colonial and non-nucleated organisms are placed in:
 A) Plantae
 B) Animalia
 C) Monera
 D) Protista
- Q.33 In lysogenic cycle, the DNA of the bacteriophages:
 A) Join the bacterial chromosome
 B) Join the bacterial plasmid
 C) Is immediately degraded when enter
 D) Attached with the ribosome

- PREPARATION
- Q.34 Which of the following disease results in paralysis due to viral attack on CNS?
 A) Small pox
 B) Hepatitis
 C) AIDS
 D) Polio
- Q.35 These are the smallest known viruses and contain RNA in spherical capsid:
 A) Pox virus
 B) Influenza virus
 C) Herpes virus
 D) Polio virus
- Q.36 Vaccination is not available for:
 A) Hepatitis 'A'
 B) Hepatitis 'B'
 C) Hepatitis 'C'
 D) Pneumonia
- Q.37 Pick the correct sequence of events during the attack of a typical virus on bacteria:
 A) Landing → Tail contraction → Penetration → DNA injection
 B) Penetration → Landing → Tail contraction → DNA injection
 C) Tail contraction → Landing → DNA injection → Penetration
 D) Landing → Penetration → Tail contraction → DNA injection
- Q.38 _____ protects the bacteria against phagocytosis.
 A) Cell wall
 B) Capsule
 C) Cell membrane
 D) Slime
- Q.39 It is the effect that instantly kills microbes:
 A) Sterilization¹⁰
 B) Microbistatic
 C) Microbicidal
 D) Antisepsis
- Q.40 Which one is primary host for tapeworm?
 A) Man
 B) Snail
 C) Cow
 D) Pig
- Q.41 For which organism, the growth is synonymous with reproduction?
 A) Unicellular algae
 B) Amoeba
 C) Bacteria
 D) All A, B, C
- Q.42 Coenocytic hyphae are always:
 A) Septate
 B) Divided by cross walls
 C) Slow growing
 D) Multinucleated
- Q.43 Sexual reproduction is present in all groups of fungi except for:
 A) Conjugating fungi
 B) Sac fungi
 C) Club fungi
 D) Imperfect fungi
- Q.44 Fungi form:
 A) Haploid zygote during asexual reproduction
 B) Haploid zygote during sexual reproduction
 C) Diploid zygote during asexual reproduction
 D) Diploid zygote during sexual reproduction
- Q.45 Intermediate host for plasmodium is:
 A) Human
 B) Male anopheles
 C) Female anopheles
 D) Snail
- Q.46 Which value of pH generally inhibits the growth of fungi?
 A) 01
 B) 06
 C) 03
 D) 09
- Q.47 Which of the following is the common feature present in all tracheophytes?
 A) True leaves, stem and roots
 B) Presence of vascular tissue
 C) Flowers for reproduction
 D) Formation of ovule
- Q.48 Most developed sub-division of tracheophytes is:
 A) Psilopsida
 B) Sphenopsida
 C) Lycopsidea
 D) Pteropsida
- Q.49 Strobili in lycopsids are clusters of:
 A) Sporangia
 B) Microphylls
 C) Sporophylls
 D) Sporangophore
- Q.50 Which of the following is formed as a result of double fertilization?
 A) Generative nucleus
 B) Fusion nucleus
 C) Tube nucleus
 D) Endosperm nucleus
- Q.51 Grade radiata includes simplest of the eumetazoans that are:
 A) Poriferans
 B) Cnidarians
 C) Platyhelminthes
 D) Echinoderms

Q.52 Which group of animals may have their evolutionary relation with choanoflagellates due to structural resemblance?

- A) Parazoa
B) Metazoa
C) Protozoa
D) Eumetazoa

Q.53 All of the following are endodermal in origin except:

- A) Liver
B) Spleen
C) Gastric epithelium
D) Intestinal epithelium

Q.54 It is true about symmetry in echinoderms:

	Larva	Adult
A)	Radial	Bilateral
B)	Bilateral	Radial
C)	Radial	Radial
D)	Bilateral	Bilateral

Q.55 Mesoderm forms a loose, cellular tissue called mesenchyma or parenchyma which fills space between ectoderm and endoderm. This is true about:

- A) Phylum cnidarian
B) Phylum platyhelminthes
C) Phylum aschelminthes
D) Phylum porifera

Q.56 It is an ectoparasite that releases an anticoagulant:

- A) *Hirudo medicinalis*
B) *Taenia solium*
C) *Ancylostoma duodenale*
D) *Enterobius vermicularis*

Q.57 These are outer and inner layers of body wall in sponge, respectively:

- A) Pinacoderm and choanoderm
B) Choanoderm and pinacoderm
C) Choanoderm and mesenchyme
D) Pinacoderm and mesenchyme

Q.58 Which body system is present in each segment of annelids separately?

- A) Digestive system
B) Circulatory system
C) Nerve cord
D) Excretory system

Q.59 Body of insects can be divided into three distinct regions:

- A) Head, neck, thorax
B) Head, thorax, abdomen
C) Mouth, thorax, abdomen
D) Head, abdomen, tail

Q.60 *Archaeopteryx* is connecting link between:

- A) Fishes and amphibians
B) Reptiles and birds
C) Amphibians and reptiles
D) Reptiles and mammals

CHEMISTRY

Q.61 Identify the correct option with same empirical formula for both compounds

- A) H_2O and H_2O_2
B) C_8H_8 and C_7H_4
C) CO_2 and CO
D) $CH_3CH(OH)COOH$ and $HCOOCH_3$

Q.62 2.00 moles of CH_4 were reacted with an excess of Cl_2 . 177.0g of CCl_4 (molar mass = 154) is obtained calculate the theoretical yield

- A) 154g
B) 300g
C) 308g
D) 462g

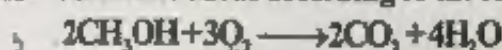
Q.63 Volume occupied by 1.5 moles of chlorine molecule at STP

- A) $22.4dm^3$
B) $44.8dm^3$
C) $33.6dm^3$
D) $3.36dm^3$

Q.64 How many numbers of molecules of O_2 produced by thermal decomposition of 245grams of $KClO_3$

- A) 1.8×10^{24}
B) 1.2×10^{24}
C) 3.6×10^{24}
D) 6.02×10^{23}

Q.65 Methanol burns according to the following equation



If 3 moles of methanol are burnt in oxygen calculate how many moles of oxygen are used

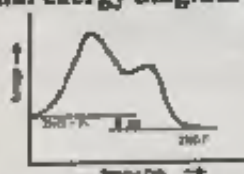
- A) 5.25
B) 4.5
C) 4.25
D) 5.5

Q.66 When 6.02×10^{23} formula units of KCl are dissolved in H_2O , they produce

- A) $0.6 \times 10^{23} K^+$ ion
B) $3.01 \times 10^{23} K^+$ ion
C) $6.02 \times 10^{23} Cl^-$ ion
D) $3.01 \times 10^{23} Cl^-$ ion

- Q.67 The force in dynes acting at right angle on a unit length of surface of a liquid is called surface tension. S.I unit of surface tension is
 A) Nm^{-1} B) g/cm.s C) Jm^{-1} D) Poise
- Q.68 The electrode through which the electron enter the electrolytic solution is
 A) Anode B) Salt bridge C) Cathode D) Electrolyte
- Q.69 Oxidation number of S in $\text{Na}_2\text{S}_2\text{O}_3$ is
 A) +1 B) +3 C) +2 D) +4
- Q.70 In which of the following compounds oxidation number of N is +5.
 A) NO_2 B) N_2O_3 C) N_2O_4 D) N_2O_5
- Q.71 In the combustion of natural gas $\text{CH}_4 + 2\text{O}_2 \rightarrow \text{CO}_2 + 2\text{H}_2\text{O}$ the number of electron loss by carbon atom will be
 A) 4 B) 2 C) 8 D) 6
- Q.72 Reaction taking place at anode in SHE is
 A) $2\text{H}^+_{(\text{aq})} + 2\text{e}^- \rightarrow \text{H}_{2(\text{g})}$ B) $\text{H}_{2(\text{g})} \rightarrow 2\text{H}^+_{(\text{aq})} + 2\text{e}^-$ C) $\text{H}_{2(\text{g})} \rightarrow \text{H}^+_{(\text{g})} + \text{e}^-$ D) $\text{H}_{2(\text{aq})} \rightarrow \text{H}^+_{(\text{aq})} + \text{e}^-$
- Q.73 $\text{MnO}_4^- + \text{X} + \text{Y} \rightarrow \text{Mn}^{2+} + 4\text{H}_2\text{O}$ In the given equation X and Y are
 A) 8H^+ and 5e^- B) 16H^+ and 3e^- C) 4H^+ and 5e^- D) 8H^+ and 3e^-
- Q.74 The enthalpy change in a chemical reaction, when reactants and products are in their standard states and their molar quantities are same as shown by the balanced chemical equation is called
 A) Standard enthalpy of formation B) Standard enthalpy of reaction C) Standard enthalpy of atomization D) Standard enthalpy of solution
- Q.75 Calculate the lattice energy for MgO from the following data
 Standard enthalpy of formation of MgO = -602kJmole^{-1}
 Standard enthalpy of sublimation of Mg = 150kJmole^{-1}
 Ionization energy of $\text{Mg}_{(\text{g})}$ to form $\text{Mg}^{2+}_{(\text{g})}$ = 2180kJmole^{-1}
 Standard enthalpy of atomization of O_2 = 247kJmole^{-1}
 Electron affinity of $\text{O}_{(\text{g})}$ to form $\text{O}^{-1}_{(\text{g})}$ = -141kJmole^{-1}
 Electron affinity of $\text{O}^{-1}_{(\text{g})}$ to form $\text{O}^{-2}_{(\text{g})}$ = 878kJmole^{-1}
 A) -3916KJ B) -2916KJ C) -4916KJ D) -1916KJ
- Q.76 S.I unit of thermal energy is
 A) Erg B) Calorie C) Dyne / m^2 D) Joule
- Q.77 When NH_4Cl is dissolved in water the solution becomes cold. The change is
 A) Endothermic B) Exothermic C) Supercooling D) None of these
- Q.78 Which of the following statement is false
 A) Temperature is a state function B) Work is a state function C) Change in the state is completely defined when the initial and final states are specified D) Work appears at the boundary of the system
- Q.79 In thermodynamics a process is called reversible when
 A) Surroundings and system change into each other B) There is no boundary between system and surroundings C) The Surroundings are always in equilibrium with the system D) The system changes into the surroundings spontaneously

- Q.80 Maximum energy is evolved in which of the following process
 A) $F + e^- \rightarrow F^{1-}$ C) $O + 2e^- \rightarrow O^{2-}$
 B) $S + 2e^- \rightarrow S^{2-}$ D) $Cl + e^- \rightarrow Cl^{1-}$
- Q.81 Which of the following species has highest ionization energy
 A) Ne C) Al^+
 B) Mg^+ D) Li^+
- Q.82 Which of the following is not tetrahedral
 A) BF_4^- C) CO_3^{2-}
 B) NH_4^+ D) SO_4^{2-}
- Q.83 BCl₃ is planar molecule because in this molecule B is
 A) sp^3 hybridized C) sp hybridized
 B) sp^2 hybridized D) dsp^2 hybridized
- Q.84 Largest bond length is
 A) N-H C) C-N
 B) C-I D) C-H
- Q.85 The molecule which is AB₃E₂ type
 A) NH₃ C) CH₄
 B) H₂S D) PCl₅
- Q.86 The rate of a reaction can be increased in general by all the factors except
 A) Using a catalyst C) Increasing the activation energy
 B) Increasing temperature D) Increasing the concentration of reactants
- Q.87 The burning of coal can be represented as $C_{(s)} + O_{2(g)} \rightarrow CO_{2(g)}$ the rate of this reaction increases by
 A) Decrease in concentration of oxygen C) Decreasing the temperature
 B) Powdering the lumps of coal D) Providing inert atmosphere for burning
- Q.88 In the reaction $X + Y \rightarrow XY$ if the concentration of X and Y are doubled, the reaction will
 A) Increase four time C) Decrease two time
 B) Increase two time D) Decrease to one half
- Q.89 Which of the following is not correct
 A) Rate law is an experimental fact, but law of mass action is theoretical
 B) Rate law is always different from the expression of law of mass action
 C) Rate law is more informative than law of mass action for the development of mechanism
 D) Order of reaction is equal to the sum of the powers of the concentration terms in the rate law
- Q.90 Potential energy diagram for the reaction between NO₂ and F₂ is given below:



Mark the incorrect statement

- A) The active activation energy for step 1 is higher than step 2
 B) Step 1 will be slow and rate determining step
 C) The active activation energy for step 1 is lower than step 2
 D) Order of reaction is 2
- Q.91 Which does not influence the rate of reaction
 A) Nature of reactant C) Temperature
 B) Concentration of reactant D) Molecularity
- Q.92 Zero order reaction means
 A) One reactant will be more in it
 B) Rate of reaction is proportional to velocity of molecules
 C) Reactants do not take part in it
 D) Reactants concentration does not change with time



- Q.93 Which order of reaction obeys the relations $t_{\frac{1}{2}} = \frac{1}{ka}$
- A) First order
B) Third order
C) Second order
D) Zero order
- Q.94 The following equilibrium exist in aqueous solution $\text{CH}_3\text{COOH} \rightleftharpoons \text{H}^+ + \text{CH}_3\text{COO}^-$ if dilute HCl is added to this solution
- A) The equilibrium constant will increase
B) The equilibrium constant will decrease
C) Acetate ion concentration will decrease
D) Acetate ion concentration will increase
- Q.95 A buffer solution is a mixture of
- A) Strong acid and strong base
B) Weak acid and strong base
C) Weak base and strong acid
D) Weak acid and its salt with strong base
- Q.96 For $\text{PCl}_5 \rightleftharpoons \text{PCl}_3 + \text{Cl}_2$; $\Delta H = 22 \text{ k.Cals}$, the dissociation of PCl_5 will be more on
- A) Increasing temperature
B) Decreasing temperature
C) Increasing pressure
D) Increasing the conc. of chlorine
- Q.97 Which of the following gaseous reaction will be favored by low pressure
- A) $\text{H}_2 + \text{I}_2 \rightleftharpoons 2\text{HI}$
B) $\text{PCl}_5 \rightleftharpoons \text{PCl}_3 + \text{Cl}_2$
C) $\text{N}_2 + 3\text{H}_2 \rightleftharpoons 2\text{NH}_3$
D) $\text{N}_2 + \text{O}_2 \rightleftharpoons 2\text{NO}$
- Q.98 A higher value for equilibrium constant shows that
- A) The reaction has gone to near completion towards right
B) The reaction has not yet started
C) The reaction has gone to near completion towards left
D) None of these
- Q.99 In the reaction $\text{N}_2(\text{g}) + 3\text{H}_2(\text{g}) \rightleftharpoons 2\text{NH}_3(\text{g})$, increase in H_2 concentration at equilibrium
- A) Favors the dissociation of NH_3
B) Does not affect the reaction
C) Increasing the equilibrium constant
D) Favors the formation of ammonia
- Q.100 For a reaction in equilibrium
- A) There is no volume change
B) The rate of forward reaction is equal to the rate of backward reaction
C) The reaction has stopped completely
D) The forward reaction is faster than reverse reaction
- Q.101 Buffer solution play an important role in
- A) Increasing the pH value
B) Keeping the pH constant
C) Decreasing the pH value
D) None of these
- Q.102 Which is the example of crystalline solids
- A) $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$
B) $\text{FeSO}_4 \cdot 7\text{H}_2\text{O}$
C) $\text{Na}_2\text{SO}_4 \cdot 10\text{H}_2\text{O}$
D) All of these
- Q.103 Isomorphic pair is
- A) ZnSO_4 and CaCO_3
B) Ag_2SO_4 and Na_2SO_4
C) ZnSO_4 and Na_2SO_4
D) NaCl and CaCO_3
- Q.104 The radius ratio of CsCl is 0.93. The structure of CsCl is
- A) Body centered
B) Cubic
C) Triangular
D) Tetrahedral
- Q.105 Factors that affect the shape of an ionic solid are
- A) Electrostatic forces of attraction
B) Poor conductivity
C) Radius ratio
D) All of these
- Q.106 Surface tension of H_2O is 7.27 Nm^{-1} and hexane is 1.84 Nm^{-1} . High surface tension of H_2O is due to
- A) Hydrogen bonding
B) London dispersion force
C) Ion dipole force
D) Debye force
- Q.107 The resistance of a liquid's to flow is called its viscosity. Viscosity depends upon
- A) Molecular shape and size
B) Intermolecular forces
C) Temperature
D) All of these



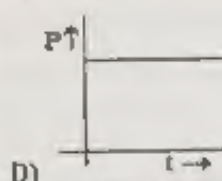
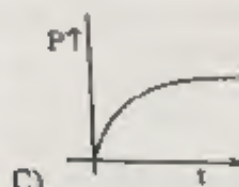
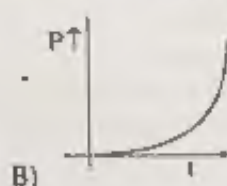
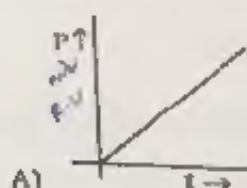
- Q.108 An increase of pressure from one to two atmosphere reduces the volume of water to 0.0054 percent. The same pressure reduces the volume of a gas up to
A) 4.5% C) 50%
B) 30% D) 5.4%
- Q.109 Four grams of CH_4 at 27°C and a pressure of 2.5atm occupies a volume of 2.46dm^3 calculate the value of R.
A) $0.0821\text{dm}^3\text{ atm / mol/K}$ C) $1.9\text{dm}^3\text{ atm / mol/K}$
B) $0.821\text{dm}^3\text{ atm / mol/K}$ D) $8.21\text{dm}^3\text{ atm / mol/K}$
- Q.110 The gas which show maximum deviation from ideal behavior is
A) H_2 C) N_2
B) CH_4 D) NH_3
- Q.111 The motion imparted to the gaseous molecules due to the oscillation is called
A) Vibrational C) Rotational
B) Translation D) All of these
- Q.112 The molecule which show only translation motion is
A) CO_2 C) NH_3
B) He D) H_2
- Q.113 The lightest positive particle obtained from _____ gas
A) He C) H_2
B) Ne D) F_2
- Q.114 The principal quantum number in an atom is 4. The maximum number of electrons that can filled is
A) 10 C) 32
B) 18 D) 54
- Q.115 An electron while moving in an orbital around the nucleus also rotates or spins about its own axis. The %age of electron in clockwise direction
A) 100% C) 50%
B) 75% D) 25%
- Q.116 The circular path of an electron around nucleus is called an
A) Orbit C) Sub-shells
B) Orbital D) None
- Q.117 The electronic configuration of $_{21}\text{Sc}$ is
A) $[\text{Ar}]4s^23d^2$ C) $[\text{Ar}]4s^23d^1$
B) $[\text{Ar}]4s^23d^1$ D) $[\text{Ar}]4s^13d^2$
- Q.118 The orbitals that have dumbbell like structure and can move in the 5-directions
A) p-Orbitals C) d-Orbitals
B) f-Orbitals D) s-Orbitals
- Q.119 Incorrect relation of energy is
A) $E = h\nu$ C) $E = \frac{hc}{\lambda}$
B) $E = hc\bar{\nu}$ D) $E = h\lambda$
- Q.120 Identify the incorrect statement
A) Positive ions move towards cathode
B) The mass of proton is 1837 times less than that of an electron
C) The mass of positive particles is never less than of a proton
D) Positive rays travel in straight line perpendicular to the anode surface

PHYSICS

- Q.121 Which of the following is the largest when the height attained by the projectile is the greatest?
A) Angle of projectile with the verticle C) Range
B) Time of flight D) None
- Q.122 Which feature of a graph determine acceleration?
A) Area under v.t graph C) Area under d.t graph
B) Slope of v.t graph D) Slope of d.t graph



Q.123 Which graph best shows variation in momentum with time by constant F ?



Q.124 A cricket player catches a ball of mass 100g and moving with a velocity of 25ms^{-1} . If the ball is caught in 0.1s , the force of the ball exerted on the hand of the player is:

- A) 4N
B) 25N

- C) 40N
D) 250N

Q.125 A body is moving in a circular path with constant speed it has

- A) Constant acceleration
B) Constant velocity

- C) Acceleration of constant magnitude
D) Acceleration which varies with time

Q.126 If the K.E of a particle is doubled its momentum will be

- A) Quadrupled
B) Doubled

- C) Remain same
D) $\sqrt{2}$ times

Q.127 A force of $2\hat{j} - 3\hat{j}$ N give displacement of $2\hat{i}$ the work done is

- A) 4
B) -6

- C) -4
D) 4

Q.128 Time taken by an engine of 10 kW to lift a mass of 2 kg to a height of 5m is

- A) 10^{-1}sec
B) 10^{-2}sec

- C) 10^{-3}sec
D) 10sec

Q.129 A ball is projected at 45° If $R_{\text{max}} = 1000\text{ m}$ velocity of projection is

- A) 10ms^{-1}
B) 100ms^{-1}

- C) 150ms^{-1}
D) 50ms^{-1}

Q.130 When a force of 100 N acts on a body of mass 50kg then acceleration produced is

- A) 3 ms^{-2}
B) 0.5 ms^{-2}

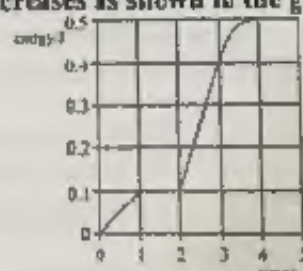
- C) 2 ms^{-2}
D) 0 ms^{-2}

Q.131 A force $6\hat{i} + 3\hat{j} + \hat{k}$ (N) displaces a particle from A (0, 3, 2) to B (5, 1, 6). Then work done is

- A) 10 J
B) 22 J

- C) 28 J
D) 41 J

Q.132 A bicycle dynamo is started at time zero. The total energy transformed by the dynamo during the first 5 seconds increases as shown in the graph



What is the maximum power generated at any instant during these first 5 seconds?

- A) 0.10 W
B) 0.30 W

- C) 0.13 W
D) 0.50 W

Q.133 A ball is projected horizontally from the top of a cliff on the surface of the earth with a speed of 40ms^{-1} . Assuming that there is no air resistance, what will its speed be 3 s later?

- A) 30ms^{-1}
B) 50ms^{-1}

- C) 40ms^{-1}
D) 60ms^{-1}

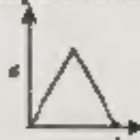
Q.134 At which point for a projectile its kinetic energy is completely converted into potential energy

- A) At point of projection
B) Point to hit the ground
C) At the highest point
D) Not possible

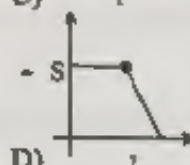
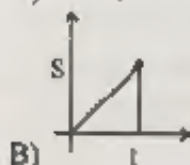
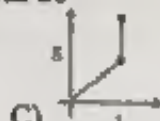
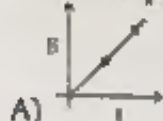
Q.135 A moving bullet hits a solid target resting on a frictionless surface and gets embedded in it. What is conserved in this process?

- A) Momentum and kinetic energy
B) Momentum alone
C) Kinetic energy alone
D) Neither momentum nor kinetic energy

Q.136 To convert given displacement-time graph into distance time graph,



The corresponding distance time graph will be



Q.137 At maximum height K.E of projectile is $\frac{1}{4}$ th of its initial K.E. The angle of projection is

- A) 30°
B) 45°
C) 60°
D) 76°

Q.138 A cyclist turns around a curve at 15 miles/hour. If he turns at double the speed, the tendency to overturn is

- A) Doubled
B) Quadrupled
C) Halved
D) Unchanged

Q.139 A stone is whirled in a vertical plane. The stone has

- A) Radial acceleration only
B) Both radial and tangential accelerations
C) Tangential acceleration only
D) Neither radial nor tangential acceleration

Q.140 A crow fly 40 m is north and then 30 m in east. The ratio of his distance to displacement

- A) 1.4
B) 1.2
C) 1.5
D) 1.8

Q.141 Four students exercise in a gym. Which student does the most work?

	Exercise time/s	Power developed/W
A)	50	250
B)	100	150
C)	200	200
D)	150	50

Q.142 $PV^\gamma = \text{constant}$ is true for

- A) Isothermal process
B) Adiabatic process
C) Isochoric process
D) Isobaric process

Q.143 During which process the change in the internal energy of the system is equal in magnitude to the work done by system

- A) Isobaric
B) Isochoric
C) Adiabatic
D) Isothermal process

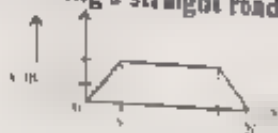
Q.144 The specific heat for an ideal gas for an adiabatic process

- A) Zero
B) Infinite
C) Remains constant
D) Positive

Q.145 Adiabatic change occurs when the gas expands or is compressed

- A) Very slowly
B) Slowly
C) Rapidly
D) Both A and B

Q.146 The velocity time graph of a car moving on a straight road is shown. Initial acceleration of car



- A) 4 ms^{-2}
 B) 8 ms^{-2}
 C) 10 ms^{-2}
 D) 15 ms^{-2}
- Q.147 What can be calculated from the curve under PV graph
 A) Heat
 B) Work done
 C) Temperature
 D) Force
- Q.148 The equivalence of two systems in thermal equilibrium is represented by
 A) Temperature
 B) Heat
 C) Specific heat
 D) Energy
- Q.149 An adiabatic process occurs at constant
 A) Temperature
 B) Pressure
 C) Heat
 D) None of these
- Q.150 The internal energy of gas during isothermal expansion
 A) Increases
 B) Decreases
 C) Remains constant
 D) Becomes zero
- Q.151 An engine is moving on a circular track with a constant speed. It is blowing a whistle of frequency 500 Hz. The frequency received by an observer standing stationary at the centre of the track is
 A) 500 Hz
 B) More than 500 Hz
 C) Less than 500 Hz
 D) More or less than 500 Hz depending on the actual speed of the engine
- Q.152 Velocity of sound in vacuum at 0°C is
 A) 332 m sec^{-1}
 B) 280 m sec^{-1}
 C) Zero
 D) 332 cm sec^{-1}
- Q.153 Speed of sound in a medium depends upon
 A) Elasticity
 B) Density
 C) Amplitude
 D) Both A and B
- Q.154 The error in the value of speed of sound calculated by Newton at S.T.P is about
 A) 14%
 B) 15%
 C) 16%
 D) 18%
- Q.155 The displacement of particle in S.H.M. in one time period, if its amplitude of its motion is "A" will be
 A) Zero
 B) A
 C) 2A
 D) 4A
- Q.156 Sound travels faster in moist air at STP because
 A) Moist air is heavier than dry air
 B) The value of γ of moist air is greater than that for dry air
 C) The pressure of moist air is greater than that of dry air
 D) The density of moist air is less than that of dry air
- Q.157 The product of angular frequency (ω) and time period T will be
 A) 1
 B) $\frac{\pi}{2}$
 C) 2π
 D) π
- Q.158 What is the speed of the tip of second's hand of a clock if its length is 10 cm?
 A) 1.05 cms^{-1}
 B) 1.05 m/s
 C) 2.05 cms^{-1}
 D) 3.05 cms^{-1}
- Q.159 A particle of rigid body is at a distance 0.1 m from axis of rotation to rotate with linear speed 3 m/s. What is angular speed of the rigid body
 A) 0.3 rad/s
 B) 3 rad s^{-1}
 C) 30 rad/s
 D) 1.5 rad/s

Q.160 If E is the K.E of body moving in circle of radius r then the centripetal force may be written as

A) $F_c = \frac{E}{2r}$

C) $F_c = \frac{E}{2r^2}$

B) $F_c = E \times 2r$

D) $\frac{2E}{r}$

Q.161 A force of 250 N acts on a body. The momentum acquired by the body is 125 kg m/s. what is the duration for which force acts on body

A) 0.5 s

C) 0.2 s

B) 125×250 s

D) 2 s

Q.162 A particle of mass m moving with velocity v strikes a stationary particle of mass 2m and sticks to it. The speed of the system will be

A) $\frac{v}{2}$

C) $\frac{v}{3}$

B) 2v

D) 3v

Q.163 Water is pouring down from a waterfall at the rate of 75kgs⁻¹ on the blades of a turbine. If the height of the 'fall' be 100 m, then the power delivered to the turbine is nearly.

A) 95kW

C) 75kW

B) 100kW

D) 0 kW

Q.164 The slope of the velocity time graph for retarded motion is

A) Positive

C) Negative

B) Zero

D) Can be +ve, -ve or zero

Q.165 An object is projected up wards with velocity of 100 m/sec. it will strike the ground in approximately ($g=10 \text{ m/s}^2$)

A) 10 sec

C) 20 sec

B) 15 sec

D) 5 sec

Q.166 A man pushes a wall but fails to displace it, it does:

A) Negative work

C) Positive work

B) No work at all

D) Maximum positive work

Q.167 For constant force, the shape of the graph between power and velocity will be

A) A circle

C) A parabola

B) A hyperbola

D) A straight line

Q.168 The momentum of the system is conserved

A) Always

C) Only in the absence of an external force

B) Never

D) Only when an external force acts

Q.169 In circular motion, if the angular velocity and angular acceleration becomes parallel, then the motion becomes:

A) Slower

C) Faster

B) Constant

D) Both A and C

Q.170 Stationary wave is produced in a string fixed at its both ends. When oscillating in its 4th mode with wavelength λ the length of string would be.

A) Twice the wave length

C) Thrice the wavelength

B) Four times the wavelength

D) Twice the half wavelength

Q.171 The distance between two consecutive in phase points on a wave is _____

A) Wavelength but corresponding time is less than a period.

B) Wavelength but corresponding time is greater than a period

C) Wavelength and corresponding time are equal to the period

D) Wavelength

Q.172 In the case of a projectile fired at an angle equally inclined to the horizontal and vertical with velocity v, the horizontal range is

A) $\frac{v^2}{g}$

C) $\frac{v^2 \sin 2\theta}{g}$

B) $\frac{v^2 \sin 2\theta}{2g}$

D) $\frac{v^2}{4g}$

- Q.173 A boy throws a ball with velocity 10 m/s in vertically upward direction. If $g = 10 \text{ m/s}^2$, the ball rises to a height
 A) 2 m
 B) 5 m
 C) 10 cm
 D) 25 m
- Q.174 The average power required to lift a 100 kg mass through a height of 50 metres in approximately 50 seconds would be, in J/s
 A) 50
 B) 100
 C) 5000
 D) 980
- Q.175 A body start its motion from point O to A then complete a circle so displacement covered by body is



- A) O
 B) R
 C) $2R$
 D) None
- Q.176 The string of length 5 m fixed at both ends is vibrating in two segments, the wavelength of wave is
 A) 2.5 m
 B) 1.25 m
 C) 5 m
 D) 10 m
- Q.177 If the frequencies of two notes in a medium are in the ratio $3 : 5$, their wavelengths are in the ratio
 A) $3 : 5$
 B) $25 : 9$
 C) $5 : 3$
 D) $9 : 25$
- Q.178 A particle moves in a circle describing equal angles in equal intervals. The velocity vectors
 A) Remains constant
 B) Changes in magnitude
 C) Changes in direction
 D) Changes both in magnitude and direction
- Q.179 How far does a car travel in 6 s if its initial velocity is 2 m/s and its acceleration is 2 m/s^2 in the forward direction?
 A) 12 m
 B) 14 m
 C) 24 m
 D) 48 m
- Q.180 The "reaction" force does not cancel the "action" force because:
 A) The action force is greater than the reaction force
 B) They act on different bodies
 C) They act in the same direction
 D) The reaction force is greater than the action force

ENGLISH

SPOT THE ERROR:

In the first type of sentences, some segments of each sentence are underlined. Your task is to identify that underlined segment of the sentence, which contains the mistake that needs to be corrected.

- Q.181 The great majority of the two hundred galleyes and eight galleasses, of which the fleet is composed, has come from Venice, under the command of Barbango.
 A) B) C) D)
- Q.182 He had just been appointed housemaster, he had made for himself a warm and busy corner of life
 A) B) C) D)
- Q.183 In order to make skiing smoother, safer, and enjoyable, a number of resorts have hired consultants to design and sculpt the trail.
 A) B) C) D)
- Q.184 He tried to keep his face stone, so a slight tinge of compassion bordered his eyes
 A) B) C) D)
- Q.185 She is such a virago and self-centred that she seems to care for nothing except her own career
 A) B) C) D)



- Q.186 Two-thirds of the mailing list which will be handed over to new data operators are
A) B) C) D)
to be typed first.
- Q.187 One of them, however, said: "She was a very old woman, who must die shortly in any case."
A) B) C) D)
- Q.188 Female workers are entitled to 56 days' rest on full salary before bearing the birth to children.
A) B) C) D)

CORRECTION

In each of the following questions, four alternative sentences are given. Choose the CORRECT one and fill the Circle corresponding to that letter in the MCQ Response Form.

Q.189

- A) People who pretends to have written material that have been written by someone else are called plagiarists.
B) People that pretend to having written material that has been written by someone else are called plagiarists.
C) People who pretend to have written material that has been written by someone else are called plagiarists.
D) People who pretend having written material that has been written by anyone else are called plagiarists.

Q.190

- A) We are currently planning proper geological survey of as many magnetic mountains as possible.
B) We are currently planning a proper geological survey of as much magnetic mountains as possible.
C) We are currently planning a proper geological survey of as many magnetically mountains as possible.
D) We are currently planning a proper geological survey of as many magnetic mountains as possible.

Q.191

- A) Don't let a lie be told.
B) Let a lie be not told.
C) Let don't a lie told.
D) Let a lie not be told.

Q.192

- A) They could put his ideas into practice, and yet no longer stand in opposition to the Padishah.
B) They could put his ideas into practice and yet no longer stand in opposition to the Padishah.
C) They could put his ideas into practice; yet no longer stand in opposition to the Padishah.
D) They could put his ideas into practice, and so no longer stand in opposition to the Padishah.

Q.193

- A) She had been hiding that sore throat for three days at least and lying to her parents in order to escape just such an outcome as this.
B) She was hiding that sour throat for three days at least and laying to her parents in order to escape just such an outcome as this.
C) She was hiding that sour throat for three days at least and laying to her parents in order to escape just such an outcome as this.
D) She had been hiding that soar throat for three days at least and lying to her parents in order to escape just so an outcome as this.

Q.194

- A) He had married, since it was so long before that none of staff at Brookfield remembers his wife.
B) He had married, despite it was so long before that none of staff at Brookfield remembers his wife.
C) He had married, though it was so long before that none of staff at Brookfield remembers his wife.
D) He had married, therefore it was so long before that none of staff at Brookfield remembers his wife.



Q.195

- A) By the time peace and happiness will have come to the planet, many lives will be wasted.
- B) By the time peace and happiness will come to the planet, many lives will be wasted.
- C) By the time peace and happiness will come to the planet, many lives would have been wasted.
- D) By the time peace and happiness will have come to the planet, many lives will have been wasted.

Q.196

- A) He would have lent me a pen if he was known that I didn't have one.
- B) He would have lent me a pen if he has been knowing that I didn't have one.
- C) He would have lent me a pen if he had known that I didn't have one.
- D) He would have lent me a pen if he had been knowing that I didn't have one.

SENTENCE COMPLETION

Fill in the blanks with appropriate word.

Q.197 His way then lay by darkling canons, rushing streams and stupendous beetling cliffs _____ with pines.

- | | |
|------------|---------------|
| A) Haggard | C) Glistening |
| B) Fringed | D) Fluttering |

Q.198 I thought of myself as a patriarch, _____ words of wisdom to all my children.

- | | |
|----------------|---------------|
| A) Insinuating | C) Evaluating |
| B) Brimming | D) Dispensing |

SYNONYMS

Choose the word that is most nearly **SIMILAR** in meaning to the word in capital letters.

Q.199 **DILAPIDATED**

- | | |
|-------------|-------------|
| A) Bettered | C) Bragged |
| B) Intrepid | D) Decrepit |

ANTONYMS

Choose the word **OPPOSITE** in meaning to CAPITALIZED word given above.

Q.200 **BASHFUL**

- | | |
|--------------|---------------|
| A) Convivial | C) Horrendous |
| B) Diffident | D) Indigent |

1. C	25. D	49. C	73. A	97. B
2. A	26. D	50. D	74. B	98. A
3. C	27. C	51. B	75. A	99. D
4. D	28. D	52. A	76. D	100. B
5. B	29. A	53. B	77. A	101. B
6. C	30. B	54. B	78. B	102. D
7. A	31. D	55. B	79. C	103. B
8. B	32. C	56. A	80. D	104. A
9. B	33. A	57. A	81. D	105. D
10. B	34. D	58. D	82. C	106. A
11. B	35. D	59. B	83. B	107. D
12. A	36. C	60. B	84. B	108. C
13. B	37. A	61. D	85. B	109. A
14. B	38. D	62. C	86. C	110. D
15. B	39. C	63. C	87. B	111. A
16. C	40. A	64. A	88. A	112. B
17. D	41. D	65. B	89. B	113. C
18. C	42. D	66. C	90. C	114. C
19. D	43. D	67. A	91. D	115. C
20. B	44. D	68. C	92. D	116. A
21. B	45. C	69. C	93. C	117. C
22. A	46. A	70. D	94. C	118. C
23. C	47. B	71. C	95. D	119. D
24. A	48. D	72. B	96. A	120. B

121 B	145 C	169 C	193 A
122 B	146 A	170 A	194 C
123 A	147 B	171 C	195 D
124 B	148 A	172 A	196 C
125 C	149 C	173 B	197 B
126 D	150 C	174 D	198 D
127 A D	151 A	175 B	199 D
128 B	152 C	176 C	200 A
129 B	153 D	177 C	
130 C	154 C	178 C	
131 C	155 A	179 D	
132 B	156 D	180 B	
133 B	157 C	181 D	
134 D	158 A	182 B	
135 B	159 C	183 A	
136 A	160 D	184 C	
137 C	161 A	185 B	
138 B	162 C	186 D	
139 B	163 C	187 D	
140 A	164 C	188 C	
141 C	165 C	189 C	
142 B	166 B	190 D	
143 C	167 D	191 D	
144 A	168 C	192 B	